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**(Amalgamating IS 12132 : 1987)**

# *भारतीय मानक*
# वस्त्रादि – वर्स्टेड सूटिंग – विशिष्टि
## *( पहला पुनरीक्षण )*

# *Indian Standard*
# TEXTILES — WORSTED SUITINGS — SPECIFICATION
## *( First Revision )*

ICS 59.020

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BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

*July* 2005 **Price Group 4**

Wool and Wool Products Including Floor Coverings Sectional Committee, TX 04

## FOREWORD

This Indian Standard (First Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Wool and Wool Products Including Floor Coverings Sectional Committee had been approved by the Textile Division Council.

This standard was first published in 1987. This revision has been taken up to update the standard on the basis of experience gained during its use to cover the following major changes:

a) Keeping in view the similarity in requirements and end use, IS 12132 : 1987 'Specification for polyester wool blended worsted suitings' has been amalgamated with this standard. Accordingly, the title of this standard has been modified to cover polyester wool blended worsted suitings also.

b) Sampling and criteria for conformity have been modified.

The composition of the Committee responsible for formulation of this standard is given in Annex C.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

# *Indian Standard*

# TEXTILES — WORSTED SUITINGS — SPECIFICATION

## *( First Revision )*

## 1 SCOPE

This standard prescribes the requirements of worsted suitings.

## 2 REFERENCES

The standards listed in Annex A contain provisions which through reference in this text, constitute provision of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision and parties to agreement based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards.

## 3 TERMINOLOGY

For the purpose of this standard, the following definitions along with those given in IS 11206 shall apply.

**3.1 All Wool Worsted Suiting** — Fabric made from virgin wool spun on combed fibre spinning system.

**3.2 Worsted Spun Yarn** — Yarn spun from long fibre slivers after removal of short fibres in the combing process.

**3.3 Virgin Wool** — Pure and new wool, commercially it means wool that has not been processed or used before and is thus distinctly different from reprocessed wool or reused wool.

## 4 MANUFACTURE

Yarn used in the manufacture of these fabrics shall be spun on combed fibre spinning system from virgin wool or with its blend with other fibres.

## 5 REQUIREMENTS

**5.1** The worsted suitings shall meet the requirements as given in Table 1.

**5.2** The worsted suitings shall be generally free from objectionable flaws such as:

a) Missing ends and picks;
b) Floats;
c) Stains;
d) Weft bars and warp section marks;
e) Big slubs, knots and specks unless they are a part of the design;
f) Prominently noticeable thick and thin places;
g) Cuts and holes; and
h) Dyeing defects (streaks, patches).

## 6 MARKING

**6.1** The cloth shall be marked with the following:

a) Name of the material;
b) Manufacturer's name, initials or of trade-mark;
c) Year of manufacture;
d) Length and width of the piece; and
e) Blend composition in accordance with IS 1793.

### 6.2 BIS Certification Marking

The worsted suitings may also be marked with the Standard Mark.

**6.2.1** The use of the Standard Mark is governed by the provisions of *Bureau of Indian Standards Act*, 1986 and the Rules and Regulations made thereunder. The details of conditions under which the license for the use of Standard Mark may be granted to manufacturers or producers may be obtained from Bureau of Indian Standards.

## 7 PACKING

**7.1** Packing may be done either in the form of a 'bale' or 'case' as required by the buyer.

### 7.2 Bale Packing

Each piece of fabric shall be folded to half of its width over a cardboard or straw board of suitable size and thickness. Each piece shall then be wrapped with low-density polyethylene film of minimum 40 micron thickness and conforming to IS 2508. A suitable number of such pieces shall again be covered with another layer of polyethylene film of the same type followed by a waterproof packing paper conforming to IS 1398 and then be enclosed in an outer layer of hessian cloth/HDPE woven fabric, preferably conforming to Type 1 of IS 2818 (Part 2)/IS 6899 respectively, in the form of a bale. The bale shall be finally strapped with metallic/synthetic straps.

### 7.3 Case Packing

Each piece of fabric to be packed shall be first folded to half of its width over a cardboard or straw board of suitable size and thickness. Each piece shall then be

## Table 1 Requirements for Worsted Suitings

(*Clause* 5.1)

| Sl No. | Characteristic | Requirement | Method of Test, Ref to |
|---|---|---|---|
| (1) | (2) | (3) | (4) |
| i) | Length, *m* tolerance | As agreed/declared/marked no negative tolerance | IS 1954 |
| ii) | Width, cm tolerance | As agreed/declared/marked ±1.25 percent subject to a maximum of 2 cm | IS 1954 |
| iii) | Mass, g/m$^2$ tolerance | As agreed/declared/marked ±3 percent | IS 1964 (*see* Note 1) |
| iv) | Crease recovery angle, *Min*: | | IS 4681 |
| | a) Warp way | 140° | |
| | b) Weft way | 140° | |
| v) | Bending rigidity, mg cm: | | IS 6490 |
| | a) Warp way | 110 to 170 | |
| | b) Weft way | 85 to 100 | |
| vi) | Drape, percent | 40 to 55 | IS 8357 |
| vii) | Pilling resistance | 4 or better | IS 10971 |
| viii) | Fibre content: | | IS 8476 |
| | a) All wool suiting | | |
| | Wool content, percent | 100 | |
| | Tolerance | Up to 0.3 percent for inadvertent fibre up to 5 percent for decorative/technical reason by using non-cellulosic fibres | |
| | b) Blend suiting: | | IS 2006 |
| | 1) Wool, percent | As declared ±3 units | |
| | 2) Polyester or other fibres, percent | As declared ±3 units | |
| ix) | Breaking strength on 5 cm × 20 cm N (kgf), *Min*: | | IS 1969 |
| | a) Warp way | 200 (20) | |
| | b) Weft way | 200 (20) | |
| x) | Relaxation shrinkage, percent, *Max*: | | Annex B |
| | a) Warp way | 2.0 | |
| | b) Weft way | 2.0 | |
| xi) | Colour fastness to: | | |
| | a) Light | 4 or better | IS 2454 |
| | b) Washing : Test 2 | | |
| | 1) Change in colour of the test specimen | 4 or better | IS 3361 |
| | 2) Staining on the adjacent fabrics | 4 or better | |
| | c) Dry-cleaning: | | IS 4802 |
| | 1) Change in colour of the specimen | 4 or better | |
| | 2) Staining of the solvent | 4 or better | |
| | d) Dry-heat treatment: | | IS 4636 |
| | 1) Change in colour of the test specimen | 3-4 or better | |
| | 2) Staining on the adjacent fabrics | 3-4 or better | |
| xii) | *p*H value of aqueous extract | 5.0 to 7.5 | IS 1390 |
| xiii) | Solvent extractable matter, percent, *Max* | 1.0 | IS 4390 (*see* Note 2) |

NOTES

1 In case of oven-dry method, the moisture regain values for wool and other fibres shall be as given in IS 13157.

2 While testing this requirement, petroleum ether solvent shall be used in place of benzene-methyl alcohol mixture.

wrapped with low density polyethylene film of minimum 40 micron thickness conforming to IS 2508. A suitable number of such pieces shall then be covered with a layer of kraft paper conforming to IS 1398 and then enclosed in a wooden case. The case shall be finally strapped with metallic/synthetic straps.

## 8 SAMPLING AND CRITERIA FOR CONFORMITY

### 8.1 Lot

The quantity of cloth delivered to a buyer against one despatch note shall constitute a lot.

**8.2** The conformity of a lot to the requirements of the standard shall be determined on the basis of the tests carried out on the samples selected from the lot.

**8.3** Unless otherwise agreed to between the buyer and the seller, the number of pieces to be selected at random shall be in accordance with col 2 and 3 of Table 2. To ensure randomness of selection, IS 4905 may be used.

### 8.4 Number of Tests and Criteria for Conformity

**8.4.1** The number of tests and criteria for conformity shall be as given in Table 3.

**Table 2 Sample Size and Criteria for Conformity**

(*Clause* 8.3, and *Table* 3)

| Sl No.<br>(1) | Lot Size<br>(2) | Sample Size<br>(3) | Acceptance Number<br>(4) | Sub-sample Size<br>(5) |
|---|---|---|---|---|
| i) | Up to 50 | 8 | 0 | 5 |
| ii) | 51 - 150 | 20 | 1 | 5 |
| iii) | 151 - 280 | 32 | 2 | 5 |
| iv) | 281 - 500 | 50 | 3 | 5 |
| v) | 501 - 1 200 | 80 | 5 | 5 |
| vi) | 1 201 - 3 200 | 125 | 7 | 5 |
| vii) | 3 201 and above | 200 | 10 | 5 |

## Table 3 Number of Tests and Criteria for Conformity

(*Clause* 8.4.1)

| Sl No.<br>(1) | Characteristics<br>(2) | No. of Pieces<br>(3) | Criteria for Conformity<br>(4) |
|---|---|---|---|
| i) | Length | According to col 3 of Table 2 | Length of each piece not to measure less than the declared or marked length |
| ii) | Width | do | Width of each piece to remain within ±2 cm of the declared width |
| iii) | Mass per square metre | do | Mass per square metre of each piece to remain within ±3 percent of the declared value |
| iv) | Relaxation shrinkage | According to col 5 of Table 2 | $(\bar{x}) + 0.4\,R <$ specified value (*see* Note) |
| v) | Pilling resistance | do | All the test specimens to satisfy the relevant requirements |
| vi) | Crease recovery angle (warp way and weft way) | According to col 5 of Table 2 | $(\bar{x}) - 0.4\,R >$ specified value (*see* Note) |
| vii) | Bending rigidity | do | All the test specimens to satisfy the relevant requirements |
| viii) | Drape, percent | do | do |
| ix) | Blend percentage | do | do |
| x) | Breaking load | do | do |
| xi) | Colour fastness | do | do |
| xii) | Solvent extractable matter and *p*H value of aqueous extract | do | do |

NOTE

$(\bar{x})$ = average value obtained by dividing the sum of the observed values by the number of test results.

$R$ = range, that is, the difference between the maximum and minimum in a set of observed values.

# ANNEX A

## (*Clause* 2)

## LIST OF REFERRED INDIAN STANDARDS

| *IS No.* | *Title* |
|---|---|
| 1390 : 1983 | Methods for determination of *p*H value of aqueous extracts of textile materials (*first revision*) |
| 1398 : 1982 | Packing paper, water-proof, bitumen laminated (*second revision*) |
| 1793 : 1973 | Guide for marking textile materials made of wool (*first revision*) |
| 1954 : 1990 | Determination of length and width of woven fabrics — Methods (*second revision*) |
| 1964 : 2001 | Textiles — Methods for determination of mass per unit length and mass per unit area of fabrics (*second revision*) |
| 1969 : 1985 | Methods for determination of breaking load and elongation of woven textile fabrics (*second revision*) |
| 2006 : 1988 | Method for quantitative chemical analysis of binary mixtures of protein fibres with certain other non-protein fibres (*second revision*) |
| 2454 : 1985 | Methods for determination of colour fastness of textile materials to artificial light (Xenon lamp) (*first revision*) |
| 2508 : 1984 | Specification for low density polyethylene films (*second revision*) |
| 2818 (Part 2) : 1971 | Indian Hessian : Part 2 305 and 229 g/m$^2$ at 16 percent contract regain (*first revision*) |
| 3361 : 1979 | Method for determination of colour fastness of textile materials to washing, Test 2 (*first revision*) |
| 4390 : 2001 | Textiles — Method for estimation of solvent soluble matter in textile materials (*first revision*) (Amalgamating IS 5152) |
| 4636 : 1988 | Method for determination of colour fastness of textile materials to dry-heat treatments (excluding pressing) (*first revision*) |
| 4681 : 1981 | Method for determination of recovery from creasing of textile fabrics by measuring the angle of recovery (*first revision*) |
| 4905 : 1968 | Methods for random sampling |
| 4802 : 1988 | Method for determination of colour fastness of textile materials to dry-cleaning (*first revision*) |
| 6359 : 1971 | Method for conditioning of textiles |
| 6490 : 1971 | Method for determination of stiffness of fabrics — Cantilever test |
| 6899 : 1997 | Textiles — High density polyethylene (HDPE) woven fabrics — Specification (*second revision*) |
| 8357 : 1977 | Method for assessment of fabric drape |
| 8476 : 1977 | Method for determination of wool content in woollen textile materials |
| 10971 : 1984 | Method for determination of pilling resistance of fabrics |
| 11206 : 1984 | Glossary of textile terms — Wool and other animal fibres, their processing and products |
| 13157 : 1991 | Textile fibres — Commercial moisture regains — Specification |

# ANNEX B

(*Table* 1)

## METHODS FOR DETERMINATION OF RELAXATION SHRINKAGE

**B-1** Prior to testing, the specimens are conditioned to moisture equilibrium in a standard atmosphere at 65 ± 2 percent relative humidity and 27 ± 2°C temperature (*see* IS 6359).

**B-2** Draw one square test specimen measuring approximately 900 mm × 400 mm and indicate warp direction by cutting a 'V' mark on one side of the warp edge.

**B-3** Mark this piece with the help of a transparent template which enables 250 mm apart marking and mark four such points in the warp as well as weft direction as shown in Fig. 1. Stitch a piece of thread of contrast colour at the marked points with a needle to make a permanent marking. The marking may be done by an indelible marking pen.

**B-4** Lay the test specimen flat in a shallow tray of size 1 000 mm × 1 000 mm × 40 mm and soak for 2 h in water weighing twenty times its own weight and leave it undisturbed for 2 h. In case of difficulty in wetting, a small quantity of non-ionic wetting agent may be used.

**B-5** After 2 h take out the test specimen and remove excess water from it by blotting it gently with a Turkish towel or blotting paper. Lay the test specimen flat without wringing and allow to dry completely under atmospheric conditions. After drying, the distance between each pair of points is measured accurately after keeping the transparent template over the fabric, taking care not to stretch or distort the fabric while measuring. Calculate the percentage shrinkage for each pair of points in both warp and weft directions as follows:

Relaxation shrinkage, $R$, for every pair is given by:

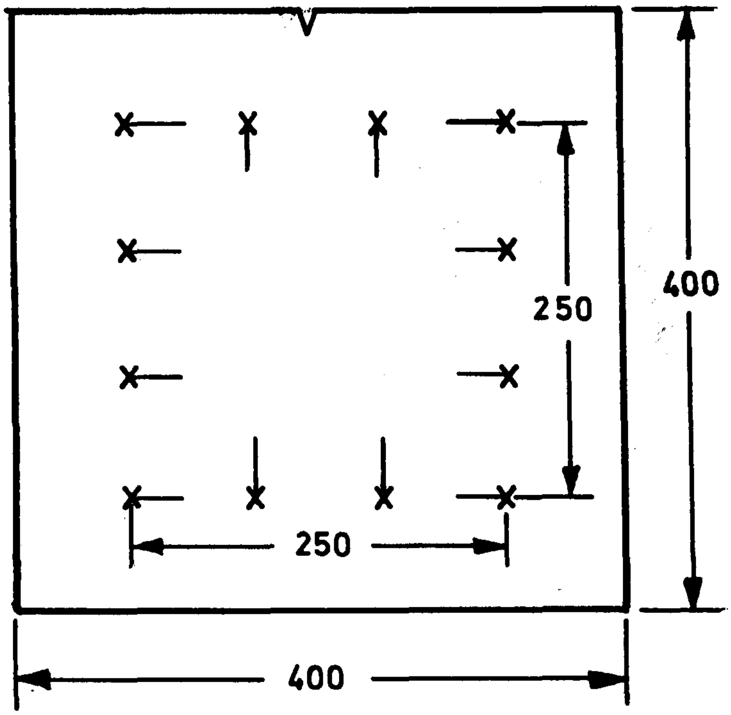
$$R = \frac{100\,(L_o - L_1)}{L_o}$$

where

$L_o$ = distance between pair of marks before treatment (that is 250 mm), and

$L_1$ = distance between pair of marks after treatment.

**B-6** The average of the warp way shrinkage percentages and the coverage of the weft way shrinkage percentages as obtained in **B-5** shall be rounded off to the nearest 0.1 percent and shall be reported as warp way and weft way relaxation shrinkage (in percentage) of the fabric in the lot.



All dimensions in millimetres.

FIG. 1 METHOD OF MARKING THE TEST SPECIMEN

# ANNEX C

## (*Foreword*)

## COMMITTEE COMPOSITION

### Wool and Wool Products Including Floor Coverings Sectional Committee, TX 04

| *Organization* | *Representative(s)* |
|---|---|
| Central Sheep & Wool Research Institute (ICAR) Avikanagar | Shri P. C. Patni (***Chairman***)<br>Dr D. B. Shakyawar (*Alternate*) |
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| Amritsar Swadeshi Woollen Mills, Mumbai | Shri Rajiv Khanna |
| All India Carpet Manufacturer‘s Association, Bhadohi | President<br>Honorary Secretary (*Alternate*) |
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| Carpet Export Promotion Council, New Delhi | Shri T. S. Chadha |
| Directorate of Handicrafts, Govt of J & K, Srinagar | Shri M. A. Allagueand |
| Directorate General of Supplies & Disposals (Inspection Wing), New Delhi | Shri Sunder Lal<br>Shri Samiron Roy (*Alternate*) |
| Directorate of Animal Husbandry, Govt. of Rajsthan, Jaipur | Dr U. K. Thanvi |
| Khadi and Village Industries Commission, Mumbai | Shri S. K. Sinha<br>Shri S. P. Gupta (*Alternate*) |
| Mumbai Grahak Panchayat, Mumbai | Representative |
| Ministry of Defence (R&D), New Delhi | Shri S. C. Jain<br>Shri R. Indushekar (*Alternate*) |
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| Office of the Jute Commissioner, Kolkata | Assistant Director (JT)<br>Assistant Director (Tech) (*Alternate*) |
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| Wool and Woollen Export Promotion Council, Delhi | Dr D. K. Verma<br>Shri Ashok K. Madhra (*Alternate*) |
| Wool Mark Company, New Delhi | Dr S. K. Chaudhuri<br>Shri Arindam Saha (*Alternate*) |
| Wool Research Association, Thane | Shri S. C.Agarwal<br>Smt G. P. Rane (*Alternate*) |
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